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GGSIPU chemistry 2006

1. 15 moles of H_2 and 5.2 moles of I_2 are mixed and allowed to attain equilibrium at 500^0 C.At equilibrium constant for the formation of HI is :

(a) 50 (b) 15

(c) 100 (d) 25

2. If,in the reaction $N_2O_4 \rightleftharpoons 2NO_2$,x is that part of N_2O_4 which dissociates,then the number number of molecules at equilibrium will be :

(a) 1 (b) 3

(c) (1+x) (d) $(1+x)^2$

3. Which of these does not influence the rate of reaction ?

(a) Nature o the reactants

(b) Concentration of the rectants

(c) Temperature of the reaction

(d) Molecularity of the reaction

4. For the reaction A+B → C,it is a found that doubling the concentration of A increases the rate by 4 times,and doubling the concentration of B doubles the reaction rate.What is the overall order of the reaction ?

(a) 4 (b) 3/2 (c) 3 (d) 1

5. The rate at which a substance reacts depends on its :

(a) atomic weight (b) atomic number

(c) molecular weight (d) active mass

6. A compound A has a molecular formula C_2CL_3OH.It reduces Fehling's solution and on oxidation,gives a monocarboxylic acid B.A can be obtained by the action of chalorine on ethyl alcohol.A is :

(a) chloroform (b) chloral

(c) methyl chloride (d) monochloroacetic acid

7. Which of the following haloalkanes is most reactive ?

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(a) 1-chloropropane (b) 1-bromopropane

(c) 2-chloropropane (d) 2-bromopropane

8. The reaction in which phenol differs from alcohol is :

(a) it undergoes esterfication with carboxylic acid

(b) it reacts with ammonia

(c) it forms yellow crystals of iodoform

(d) it liberates H_2 with Na metal

9. An organic compound A containing C,H and O has a pleasant odour with boling point of 78^0 C. On boiling A with concentrated H_2SO_4, a colourless gas is produced which decolourises bromine water and alkaline $KMbO_4$.The organic liquid A is :

(a) C_2H_5CL (b) $C_2H_5COOCH_3$

(c) C_2H_5OH (d) C_2H_6

10. Which of the following is an amphoteric acid ?

(a) Glycine (b) Salicylic acid

(c) benzoic acid (d) Citric acid

11. Gold is extracted be hydomemetallurgical process,based on its property :

(a) of being electropositive

(b) of being less reactive

(c) to from complexes which are water soluble

(d) to form salts which are water soluble

12. In blast furnace,iron oxide is reduced by :

(a) hot blastoff air (c) carbon monoxide

(c) carbon (d) silica

13. Which of the following pairs of elements cannot from an alloy ?

(a) Zn,Cu (b) FE,Hg

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(c) Fe,C (d) Hg,Na

14. Which compound is zero valent metal complex ?

(a) $[Cu(NH_3)]SO_4$ (b) $[Pt(NH_3)_2 CL_2]$

(c) $[Ni(CO)_4]$ (d) $K_3[Fe(CN)_6]$

15. Alum is a water purify because it :

(a) coagulates the impurities

(b) softens hard water

(c) gives taste

(d) destroys the pathogenic bacteria

16. For the reaction $N_2(g) + O_2(g) \rightleftharpoons 2NO(g)$,the value of K_c at 800_0 C is 0.1.when the equilibrium concentration of both the reactants is 0.5 mol,what is th value of K_p at the same temperature ?

(a) 0.5 (b) 0.1 (c) 0.01 (d) 0.025

17. The extent of adsoption of a gas in a solid depends on :

(a) nature of a gas

(b) pressure of a gas

(c) temperature of a gas

(d) all the above

18. A emulsifier is a substance which :

(a) stabilises the emulsion

(b) homogenizes the emulsion

(c) coagulates the emulsion

(d) accelerates thedisperison of liquid in liquid

19. Which of the following types of metals from the most catalyst ?

(a) Alkali metals (b) Alkaline earth metals

(c) Transition metals (d) all the above

20. The species among the following,which can act a an acid and a base is :

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(a) HSO^-_4 (b) SO_4^{2-}

(d) H_3O^+ (d) CL^-

21. Benzyl alcohol and sodium benzoate is obtained by the action of sodium hydroxide on benzaldehyde.This reaction is known as :

(a) Perkin's reaction

(b) Cannizaro's reaction

(c) Sand meyer's reaction

(d) Claisen condensation

22. Ethyl chloride on heating with AgCN forms a compound x,The functional isomer of x is :

(a) C_2H_5NC (b) $C_2H_5NH_2$

(c) C_2H_5CN (d) none of these

23. A compound, containing with carbon,hydrogen and oxygen,has a molecular weight of 44.On complete oxidation it is converted into a compound of molecular weight 60.The original compound is :

(a) an aldehyde (b) an acid

(c) an alcohol (d) an ether

24. Grignard reagent adds to :

(a) > C = O (b) $-C \equiv N$

(c) > C = S (d) all of these

25. Which of the following biomolecules contain non-transition metal ion ?

(a) Vitamin B_{12} (b) Chlorophyll

(c) Haemoglobin (d) Insulin

26. A mixture of two mole of oxygen,in a closed vessel is ignited to convert the carbon monoxide to carbon dioxide.If aH is the enthalpy change and aE is the change in internal energy,then :

(a) aH > aE (b) aH < aE

(c) aH = aE (d) the relationship depends on the capacity of the vassel

27. The cooling in refrigerator is due to :

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(a) reaction of the refrigerator gas

(b) expansion of ice

(c) the expansion of the gas in the refrigerator

(d) the work of the compressor

28. For a system in equilibrium, $\Delta G = 0$ under conditions of constant :

(a) temperature and pressure

(b) temperature and volume

(c) pressure and volume

(d) energy and volume

29. Molar heat of vaporization of a liquid is a 6 kJ mol^{-1}. If the entropy change is 16 J $mol^{-1}K^{-1}$,the boiling point of the liquid is :

(a) 375^0 C (b) 375 K

(c) 273 K (d) 102^0C

30. The temperature of the system decrease in an :

(a) adiabatic compression

(b) isothermal compression

(c) isothermal expansion

(d) adiabatic expansion

31. A buffer solution has equal volumes of 0.2 M NH_4OH and 0.02 M NH_4CL.The pK_b of the base is 5.The pH is :

(a) 10 (b) 9 (c) 4 (d) 7

32. The hydrogen electrode is dipped in a solution of pH 3 at 25^0 C.The potential would be (the value of 2.303 RT/F is 0.059 V) :

(a) 0.177 V (b) 0.087 V

(c) 0.59 V (d) - 0.177 V

33. 20 mL of 0.5 N HCL and 35 mL of 0.1 N NaOH are mixed.The resulting solution will :

(a) be natural (b) be basic

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(c) turn phenolphthalein solution pink

(d) turn methyl orange red

34. Corrosion ofiron is essentially an electrochemical phenomenon where the cell reactions are :

(a) Fe is oxidized to Fe^{2+} and dissolves oxygen in water is reduced to OH^-

(b) Fe is oxidized to Fe^{3+} and H_2O is reduced to O_2^{2-}

(c) Fe is oxidized to Fe^{2+} and H_2O is reduced to O_2^-

(d) Fe is oxidized to Fe^{2+} and H_2O is reduced to O_2

35. The standard electrode potential is measured by :

(a) electrometer (b) voltmeter

(c) pyrometer (d) galvanometer

36. A precipitate of AgCL is formed when equal volumes of the following are mixed :

[K_{sp} for AgCL = 10^{-10}] :

(a) 10^{-4} M $AgNO_3$ and 10^{-7} M HCL
(b) 10^{-5} M $AgNO_3$ and 10^{-6} M HCL
(c) 10^{-5} M $AgNO_3$ and 10^{-4} M HCL
(d) 10^{-6} M $AgNO_3$ and 10^{-6} M HCL

37. Which one of the following defects in the crystals lowers its density ?

(a) Frenkel defect

(b) Schottky defect

(c) F-centres

(d) Interstitial defect

38 A radioactive isotope has a life of 10 days .If today 125mg is left over ,what was its original weight 40 days earlier ?

(a) 2 g (b) 600 mg

(c) 1 g (d) 1.5 g

39. Which of the following can not be accelerated ?

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(a) ~-particle (b) -particle

(c) Protons (d) Neutrons

40. In which the following nuclear reaction neutrons is emitted ?

(a) $^{27}_{13}AL + ^{4}_{2}He \rightarrow ^{30}_{15}P$

(b) $^{12}_{6}C + ^{1}_{1}H \rightarrow ^{13}_{7}N$

(c) $^{30}_{15}P \rightarrow ^{30}_{14}Si$

(d) $^{241}_{96}Am + ^{4}_{2}He \rightarrow ^{245}_{97}Bk$

41. Molarity of 0.2 N H_2SO_4 is :

(a) 0.2 (b) 0.4

(c) 0.6 (d) 0.1

42. In the equation of state of an ideal gas PV = nRT,the value of the universal gas constant would depend only on :

(a) the nature of the gas

(b) the pressure of the gas

(c) the units of the measurement

(d) none of the above

43. A commercial sample of hydrogen peroxide I labeled as 10 volume.Its percentage strength is nearly :

(a) 1% (b) 3%

(c) 10% (d) 90%

44. Activated charocoal is used to remove colouring matter pure substance.It works by :

(a) oxidation (b) reduction

(c) bleaching (d) adsorption

45. When plants an animals decay,the organic nitrogen is converted into inorganic nitrogen.The inorganic nitrogen is in the form of :

(a) ammonia (b) elements of nitrogen

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(c) nitrates (d) nitredes

46. Three dimensional molecules with cross links are fomed in the case of a :

(a) thermoplastic (b) thermosetting plastic

(c) both (a0 and (b)

(d) none of the above

47. Sucrose molecule is made up of :

(a) a gluco-pyranose and a fructo-pyranose

(b) a gluco-pyranose and a fructo-furanose

(c) a gluco-furanose and a fructo-pyranose

(d) a gluco-furanose and a fructo-furanose

48. Water insoluble component of starch is :

(a) amylopectin (b) amylose

(c) cellulose (d) none of these

49. An example for a saturated fatty acid,present in nature is :

(a) oleic acid (b) linoleic acid

(c) linolenic acid (d) palmitic acid

50. A nanopeptide contains peptide linkages :

(a) 10 (b) 8

(c) 9 (d) 18

51. A gas decolourised by $KMnO_4$ solution but gives no precipitate with ammonical cuprous chloride is :

(a) ethane (b) methane

(c) ethane (d) acetylene

52. $H_3C - \overset{O}{\overset{\|}{C}} = CH - \overset{O}{\overset{\|}{C}} - CH_3$

CL CH_3

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(a) 2-chloro-4-methyl-2-pentene
(b) 4-chloro-2-methyl-3-pentene
(c) 4-methyl-2-chloro-2-pentene
(d) 2-chloro-4,4-dimethyl-2-butene

53. Amongst the following the compound that can most readily get sulphonated is :

(a) benzene (b)toluene

(c) nitrobenzene (d) chlorobenzene

54. Household gaseous fuel (LPG) mainly contains :

(a) CH_4 (b) C_2H_2 (c) C_2H_4 (d) C_4H_{10}

55. Use of chlorofluoro carbons is not encouraged because :

(a) they are harmful to the eyes of people that use it

(b) they damage the refrigerators and air conditioners

(c) they at aay the ozone in the atmosphere

(d) they destroy the oxygen layer

56. An example of a sulphur containing amino acid is :

(a) lysine (b) serine

(d) cysteine (d) tyrosine

57. Which of the following is represented in a nucleotide ?

(a) Cytosine (b) Guanine

(c) Adenine (d) Tyrosine

58. Antisptic chloroxylenol is :

(a) 4-chloro-3,5-dimethyl phenol

(b) 3-chloro-4,5-dimethyl phenol

(c) 4-chloro-2,5-dimethyl phenol

(d) 5-chloro-3,4-dimethyl phenol

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59. An atom of an element A has 3 electrons in its outermost orbit .The formula of the compound between these two will be :

(a) A_3B_6 (b) A_2B_3

(c) A_3B_2 (d) A_2B

60. Among Na^+,Na,Mg and Mg^{2+},the largest particle is :

(a) Mg^{2+} (b) Mg

(c) Na (d) Na^+

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